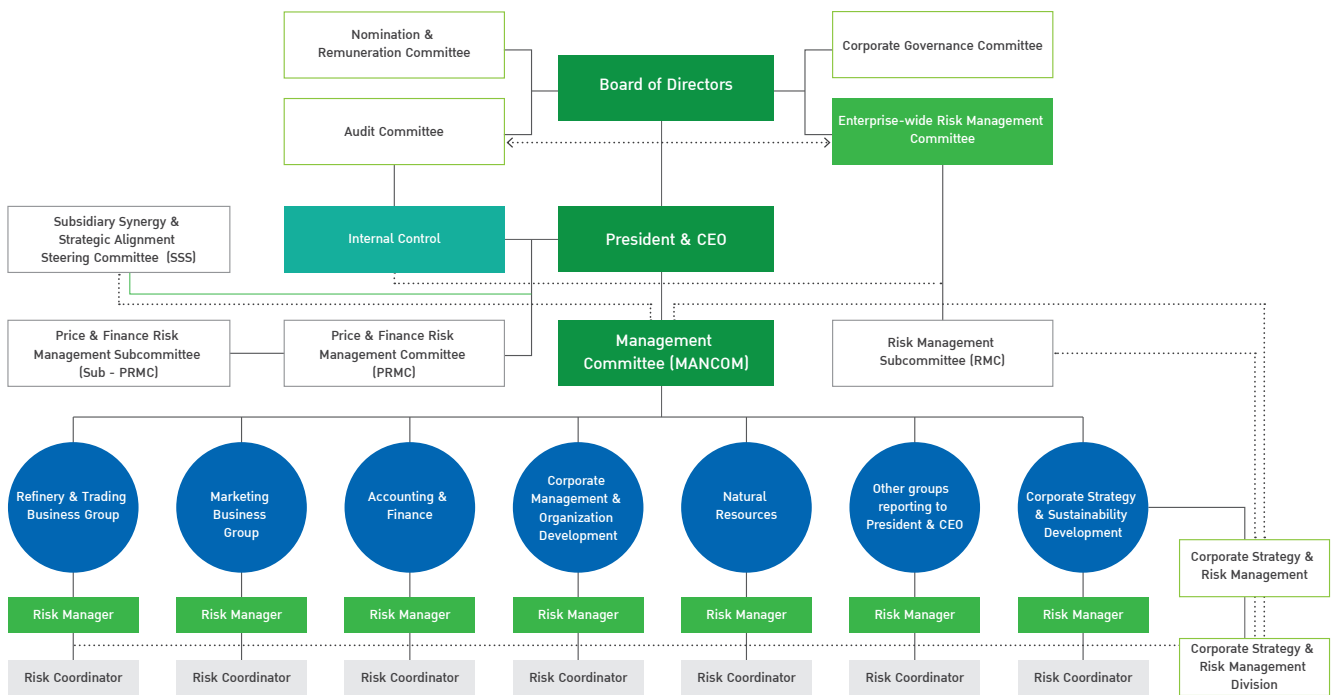


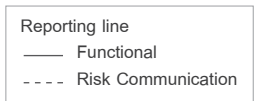
Corporate Risk Management

It has been over 15 years that Bangchak has applied the risk management framework in the organization. The international standards COSO ERM and ISO 31000 are adopted and used to define the management guidelines in order to prevent and reduce risks that may cause the company from not achieving the set objectives. (Disclosure 102-11) This is to ensure our stakeholders that the company will be able to operate business in a rapidly changing environment today. By that, the management, employees of all levels and joint venture companies are involved and take an active role in the implementation of standard risk management systems. Risk management is particularly done following the strategic planning process, policy on the sustainable business development in harmony with environment, social and governance (ESG). The Corporate Risk Management Committee oversees the entire implementation of risk management to ensure the achievement of shared business targets by the following risk management structure:



Remarks

Risk Manager – vice president / designated person
 Risk Coordinator – assigned by Senior Executive Vice President / Executive Vice President



Risk Management Performance

In the year 2019, the world economy significantly declined, affecting Thailand's economy causing a downturn in the production and household consumption sectors. The value of baht, crude oil and prices of agricultural products fluctuated the whole year. However, the company has prepared a risk management plan for the entire organization, including joint venture companies in order to reduce impact on the business. A close monitoring was pursued to follow up overall impact and to control risks in an acceptable level while also planning to support the overall changes.




In order to ensure continuity and sustainability of operations, the company has also taken into consideration Mega Trend and Global Risk, including business environment factors that are expected to change and affect business operations for management of medium to long-term risks, Risk consideration include industrial business competitions, economic conditions, consumer behavior, environment and climate change, technology advancements and innovations like renewable energy technology and energy storage, advancement of electric vehicles, biological technology, government policies, this also covers the stakeholder's needs and expectations that were collected and analyzed for impact and trend for long-term risk management together with the organization's strategic plan to achieve mutual sustainability.

The company formed the risk framework to properly assess and prepare the risk management plans, consisting 1) corporate Risk Management 2) Risk Management for Investment Projects and 3) Business Continuity Management. The progress of each operation is as follows:

1. Corporate Risk Management

Corporate risk management is the assessment of key risks considering both internal and external factors, the future trends that may affect the short, medium and long-term organizational goals, including the sensitive analysis of various factors covering strategic, operational, financial and reputation risks. To know about the impact of risks, the company kept close monitoring the opportunities of risk occurrence through key risk indicators (KRIs). The company also prepared additional risk management plans to reduce possible impact on the business goals. In 2019, the company assessed key risks in accordance with the corporate strategic plans and sustainable business development in harmony with environmental, social and governance consideration which can be summarized as follows:

Economic Risks (Disclosure 102-29)

Risk Issues	Risk Mitigation Measures
<p>1. Risks arising from the fluctuation of oil prices and production of raw materials prices</p> <p>Cause The impact of oil prices in world market caused by the slowdown of global economy and currency fluctuations</p> <p>Impact on the company The fluctuations of oil and raw materials prices can highly affect the revenue stability of the petroleum business and other business groups</p> 	<p>The company therefore has a risk management plan to deal with fluctuations in oil prices and raw material prices, both short and long term :</p> <ul style="list-style-type: none"> • Provide oil price tracking for crude oil and refined oil and regularly develop new price risk management tools. There are both Subcommittee and Price and Financial Risk Management Committee who consider and decide risk prevention options and report directly to the company's board of directors. • Diversify risk from fluctuations in agricultural raw material prices through investment in the biological products business of BBGI Public Company Limited. It increases the competitiveness of the business of production and distribution of biofuels, biodiesel and ethanol. It aims to expand the business of high value Bioproducts in the future too and create more value for the business
<p>2. Risks of raw material and supply chain management</p> <p>Cause In the year 2019, t tighter global supply due to geopolitical risk affected raw material and supply chain management (Geopolitics) Demand for high-sulfur fuel oil has dropped continuously even before the new regulation from the International Maritime Organization (IMO) came into effect on January 1, 2020, and the fluctuation of agricultural production quantity which is used as raw material for fuel.</p> <p>Impact on the company This may affect business continuity due to the availability of raw materials for production and delayed delivery for distribution.</p> 	<p>The company has prepared the risk management for the business partners to be able to operate continuously as follows:</p> <ul style="list-style-type: none"> • Procuring quality crude oil that is suitable for the production process and provides good GRM to add value to the business • Preparing a long-term contract for the purchase of crude oil from both foreign and domestic suppliers • Reserving and procuring raw materials for production of biofuels from production sources that are at a reasonable and competitive price • Assessing the risk of supplier adequacy by grouping suppliers such as group of raw materials, product and high value services suppliers. Also, assessing risks that may cause economic, social and environmental impact on the company and suppliers
<p>3. Risks from fluctuations in exchange rates and interest rates</p> <p>Cause Throughout the year 2019, the exchange rate fluctuated due to the uncertainty of financial policy, international trade policy, the announcement of Federal Reserve (FED) to cut interest rate three times, and the exit of UK from the EU (no-deal Brexit).</p> <p>Impact on the company Affect the financial costs and the company's net profit.</p> 	<p>The company has a plan to manage the risk of exchange rate and interest rate continuously as follows:</p> <ul style="list-style-type: none"> • Managing income and expenses in foreign currencies as for the natural hedge • Having Price and Financial Risk Management Committee to follow up closely the financial market trends and to consider an execution of risk management on foreign exchange and interest rate. This is to ensure that the operation is in line with the company's business goals

Social Risks (Disclosure 102-29)

Risk Issues	Risk Mitigation
<p>1. Operational risks that may affect communities and society</p> <p>Cause Economic development, urban expansion and communities surrounding the refinery</p> <p>Impact on the company Confidence of communities and society towards Bangchak's business</p>	<p>The company has implemented additional measures as follows</p> <ul style="list-style-type: none"> • Developing occupational health and safety systems according to ISO 45001 standards. The company has been ISO 45001 certified since May 2019. • Carrying out the construction of an enclosed ground flare project to reduce the impact of light and noise on the community. Construction will be completed in 2020 • Providing a boat to remove oil spills. The modern, high-performance Sri Thararak 8 boat can store 30,000 liters of oil per hour and work fast because of its Side Collecting Boom with built-in Belt Skimmer. • Preventing oil spills in the river by using a crude and refined oil tanker with a double hull to enclose the 2-layer oil storage crust while operating and with the improved port safety technology in accordance with the standards of Oil Company International Marine Forum. • Using the Process Safety Management System related to the refining process at all stages • Installing air quality meter online and sending results to automatic monitoring display around the refinery and to the nearby areas to build public confidence. • Organizing activities to raise awareness about safety. Installing communication and warning systems in the area and inviting community representatives to join emergency drills. • The Corporate Risk Management Committee is responsible for monitoring potential risks in the communities caused by the operation of joint venture companies in every site throughout the year



Environmental Risks (Disclosure 102-29)

Risk Issues	Risk Mitigation
<p>1. The risk of climate change and the environment</p> <p>Cause The impact of climate change is becoming more serious. Various countries are taking measures to delay the rise of earth's temperature not to exceed 1.5-2 °C by reducing greenhouse gas emissions.</p> <p>Impact on the company The company must take responsibility in finding measures or innovation to control or reduce greenhouse gas emissions from business processes. The company should also comply with the related government's rules and regulations, domestically and internationally.</p>	<p>The company has the following measures</p> <ul style="list-style-type: none"> • Setting goals for the management of this issue and including the reduction of greenhouse gas emissions in the corporate KPIs • Investing for the establishment of the Continuous Catalyst Regeneration Unit to increase the efficiency of the oil refining process and to reduce energy consumption, scheduling for an operation in 2020 • Using natural gas, which is green energy, as the primary fuel in the oil refining process and in the generation of power and steam of the co-generation plant • Investing for the improvement of the production unit with a budget of 7,000-8,000 million baht for EURO 5 standard fuel products with a sulfur value not exceeding 10 ppm. The construction will be completed by 2024. • Focusing on the distribution of renewable energy that is environmentally friendly. In 2019, the production and distribution of high-diesel B20 S helped reduce pollution from combustion and dust because there is the mixture of biodiesel B100, an environmentally friendly green energy. • Expanding investment in power generation from (renewable) green power, such as solar energy, wind energy, hydro power and geothermal energy, domestically and internationally through the investment of BCPG Public Company Limited. It can now help reduce carbon dioxide emissions in the atmosphere from power generation by up to 645,399 tons / year or the equivalent of forest area in the amount of 474,558 rai.





<p>2. Risks from water scarcity and water quality</p> <p>Cause Water is important to every form of life but climate change affects the volume of rain. Cutting woods and increasing population are also factors causing limited water supply for agriculture, industry, utility and consumption.</p> <p>Impact on the company From the site inspection with the Aqueduct Water Risk Atlas of the World Resources institute, it is found that the refinery business is located in areas with moderate to high water risk due to the risk of quality and quantity of water that may affect the water used in Production process. Higher cost of water may also be a risk arising from regulatory changes and price structure. Conflicts with stakeholders in the use of water resources (Stakeholder conflict) may be possible too.</p>	<p>The company's production process management to reduce the use of water resources is as follows</p> <ul style="list-style-type: none"> • Monitoring of possible risks from climate change, including <ul style="list-style-type: none"> - Drought situation - finding reserved source of water in case of emergency - Flood situation - preventing flooding in risky areas - Monitoring water levels in Chao Phraya River which may also affect oil transportation • Reducing the amount of water in production. Approximately 50,650 cubic meters was reduced in 2019 through the quality improvement process of tap water such as the Micro-Filtration system, the Reverse Osmosis System and the electro-De-ionization System. • Reusing of slightly contaminated condensate water and treated water passing through the quality improvement of Reverse Osmosis System in the amount of 525,179 cubic meters, equal to saving clean water for 3,185 households.
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Risk Issues	Risk Mitigation
	<ul style="list-style-type: none"> In the year 2019, the company is the first oil refinery in Thailand certified for water management by the Water Footprint of 6 products from the Institute of Water and Environment for Sustainability by The Federation of Thai Industries Encouraging affiliates to reduce the use of water in the production process and to reuse water from the production process. In addition, there is a project to dig raw water wells to reserve water for use in the factory area

Emerging Risk (Disclosure 102-29)

Risk Issues	Risk Mitigation Measures
<p>1. Risk from Information Security/Cybersecurity</p> <p>Cause Due to today's competition and business development, it is necessary to rely on the use of modern technology and data links. Through the internet all the time.</p> <p>Impact on the company If a cyber threat occurs it may cause business interruption and affect the reputation of the company. If the company is not prepared to use technology, it might reduce the efficiency in competition, production and service.</p> 	<p>The company has taken steps to reduce the risk as follows</p> <ul style="list-style-type: none"> In the year 2019, the Enterprise-wide Risk Management Committee regarded risk management in the event of a business system interruption from cyber attacks as an important issue and established a close monitoring of risk indicators through Security System Alert continuously. In the year 2019, the company received the certification of ISO 27001 continuously, covering the Distributed Control System and the Refinery Cyber Security System to prevent cyber attacks against the company's distillation systems. Established measures to prevent the risk of personal data protection under the "Personal Data Protection Act 2562", the determination of solutions and prevention in the event that personal data is used incorrectly or may cause damage to the company. In the year 2019, digital technology was used to increase efficiency in various tasks as follows: <ul style="list-style-type: none"> Robotic Process Automation was used to check supplier's status, service station maintenance planning, and to issue product sales documents Planned for predictive maintenance by connecting the equipment usage data to the processing system Technology analytics was used to analyze behavior and design services that address the needs of consumers and increase service satisfaction.
<p>2. Risk from changes in energy innovation</p> <p>Cause The rapidly changing energy innovation of the world as well as government measures in various countries and consumer awareness of the environment</p> <p>Impact on the company It is a business opportunity. The company therefore aims to develop the potential and expand the business with green innovation in energy to support the energy business in the future.</p> 	<p>The company has analyzed, evaluated risks and identified opportunities from advances in energy innovation by proceeding as follows:</p> <ul style="list-style-type: none"> invested in lithium mining through Lithium Americas Corp. to support the growth of renewable energy that requires batteries, including electric vehicles. Established Bangchak Initiative and Innovation Center (BiIC) to create a Green Ecosystem to drive innovation of green energy and bio-based.

2. Risk Management of Investment Projects

Besides the consideration of consistency of the organization's strategic direction and the return of the business, risk management of investment projects is an important and essential part of the business operations. Therefore, every investment project must have a clear systematic risk analysis in each project timeline as follows:

- 🟢 Development Phase Risk
- 🟢 Construction Phase Risk
- 🟢 Operation Phase Risk, including operational risk, financial risk, tax risk which is depending on tax policy of the invested country, business and reputation risks
- 🟢 Natural Disaster Risk

In the year 2019, the Corporate Risk Management Committee approved and monitored the progress of the risk management plan of the investment project through the subsidiary by purchasing additional shares of OKEA AS ("OKEA"), which operates, develops, and produces petroleum in the country, resulting in liquidity to expand and develop petroleum production in the future.

3. Business Continuity Management (BCM)

To build confidence that the company will be able to continue operating despite the crisis, the company has adopted and applied a business continuity management system. As a result, the company has been certified with business continuity management certification ISO 22301: 2012 covering the headquarters Bangchak Oil Refinery and Bangchak Oil Distribution Center Central business office and Bang Pa-in oil distribution center since 2013 for the sixth consecutive year.

4. Promoting a culture of risk management within the organization and companies within the group

The company promotes a culture of risk management in the organization and extends it to companies in the group by allowing all departments in the Bangchak Group of Companies to create a risk plan every year. In 2019, the company revised the crisis management plan and the business continuity management plan for the entire organization including identifying indicators and reviewing the resources used for management every year. In addition, the company has rehearsed business continuity management plans and emergency response plans in the event of a cargo ship crashing into the harbor. The rehearsal covered the communication between executives and staff involved together with the participation and observation of external agencies such as the Department of Energy Business Pollution Control Department, Port Department of Port Authority of Thailand Phra Khanong District and Office Environmental Conservation Association of the Oil Industry Group Bang Nam Phueng community, etc., The outcome of the practice was taken to improve the company's operating procedures so as to create more effective business continuity management system, and to build confidence that in the event of a crisis, the company will be able to manage the incident and conduct the business continuously.

In the year 2019, the company received three awards from Thailand's Greenhouse Gas Management Organization, the three awards were:

1. Carbon Footprint of Product (CFP) Award
2. Award of greenhouse gas reduction in accordance with the refinery target of 2% under the Voluntary Emission Reduction Program in accordance with Thailand Voluntary Emission Reduction Program (T-VER) for 3 years
3. Carbon Footprint Reduction (CFR) Label Award from the study of the development of an eco-efficiency management system for sustainable environmental refinery business development management

